Developed by the Elementary Science Support Center,
Purdue University Calumet, Hammond, Indiana

SCIS 3+ Correlation
National Science Education Standards
Levels 5-6

	Level 5 *Communities*	Level 5 *Energy Sources*	Level 6 *Ecosystems*	Level 6 *Scientific Theories*
Unifying Concepts and Processes				
Unifying Concepts and Processes				
Systems, order and organization	☆	☆	☆	☆
Evidence, models and explanation	☆	☆	☆	☆
Change, constancy and measurement	☆	☆	☆	☆
Evolution and equilibrium	☆		☆	
Form and function	☆		☆	
Science as Inquiry				
Abilities Necessary to Do Scientific Inquiry				
Identify questions that can be answered through scientific investigations	☆	☆	☆	☆
Design and conduct a scientific investigation	☆	☆	☆	☆
Use appropriate tools and techniques to gather, analyze and interpret data	☆	☆	☆	☆
Develop descriptions, explanations, predictions, and models based on evidence	☆	☆	☆	☆
Think critically and logically to make the relationships between evidence and explanations	☆	☆	☆	☆
Recognize and analyze alternative explanations and predictions	☆	☆	☆	☆
Communicate scientific procedures and explanations	☆	☆	☆	☆
Use mathematics in all aspects of scientific inquiry	☆	☆	☆	☆
Understanding about Scientific Inquiry				
Different kinds of questions suggest different kinds of scientific investigations	☆	☆	☆	☆
Current scientific knowledge and understanding guide scientific investigations	☆	☆	☆	☆
Mathematics is important in all aspects of scientific inquiry	☆	☆	☆	☆
Technology used to gather data enhances accuracy and allows scientists to analyze and quantify results of investigations	*	*	*	*
Scientific explanations emphasize evidence, have logically consistent arguments and use scientific principles, models and theories	☆	☆	☆	☆
Science advances through legitimate skepticism	☆	☆	☆	☆
Scientific investigations sometimes result in new ideas and phenomena for study, generate new methods or procedures, or develop new technologies to improve data collection				☆
Physical Science				
Properties and Changes of Properties in Matter				
A substance has characteristic properties, such as density, boiling point and solubility which are independent of the amount of the sample				
A mixture of substances often can be separated into the original substances using one or more of its properties				
Substances react chemically in characteristic ways with other substances to form new substances (compounds) with different properties				
Chemical elements do not break down during normal laboratory reactions involving such treatment as heating, exposure to electric current or reaction with acids				

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Motions and Forces				
The motion of an object can be described by its position, direction of motion and speed		☆		☆
An object that is not being subjected to a force will continue to move at a constant speed and in a straight line		☆		☆
If more than one force acts on an object along a straight line, then the forces will reinforce or cancel one another, depending on their direction and magnitude				
Unbalanced forces will cause changes in the speed or direction of an object's motion		☆		☆
Transfer of Energy				
Energy is a property of many substances and is associated with heat, light, electricity, mechanical motion, sound, nuclei and the nature of a chemical		☆		☆
Energy is transferred in many ways		☆		☆
Heat moves in predictable ways, flowing from warmer objects to cooler ones, until both reach the same temperature		☆		
Light interacts with matter by transmission (including refraction), absorption, or scattering (including reflection)		☆		☆
Electrical circuits provide a means of transferring electrical energy when heat, light, sound and chemical changes are produced		☆		☆
In most chemical and nuclear reactions, energy is transferred into or out of a system. Heat, light, mechanical motion or electricity might all be involved in such transfers		☆		
The sun is a major source of energy for changes on the earth's surface		☆		
A tiny fraction of light from the sun reaches the earth, transferring energy from the sun to the earth		☆		
Life Science				
Structure and Function in Living Systems				
Living systems at all levels of organization demonstrate the complementary nature of structure and function	☆		☆	
Important levels of organization for structure and function include cells, organs, tissues, organ systems, whole organisms and ecosystems	☆		☆	
All organisms are composed of cells - the fundamental unit of life				
Cells carry on the many functions needed to sustain life; they grow and divide, take in nutrients, and make the materials that a cell or an organism needs				
Specialized cells perform specialized functions in multicellular organisms				
The human organism has systems for digestion, respiration, reproduction, circulation, excretion, movement, control, coordination and protection from disease. These systems interact with one another				
Disease is a breakdown in structures or functions of an organism				

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Reproduction and Heredity				
Reproduction is a chracterisitc of all living systems	☆			
Some organisms reproduce asexually, others reproduce sexually				
Every organism requires a set of instructions for specifying its traits				
Heredity is the passage of these instructions from one generation to the next				
Heredity information is contained in genes, located in the chromosomes of each cell				
The characteristics of an organism can be described in terms of a combination of traits. Some traits are inherited while others result from interactions with the environment	☆			
Regulation and Behavior				
All organisms must be able to obtain and use resources, grow, reproduce and maintain stable internal conditions while living in a constantly changing external environment	☆		☆	
Behavior is one kind of response an organism can make to an internal or environmental stimulus			☆	
Behavioral response is a set of actions determined in part by heredity and in part from experience				
An organism's behavior evolves through adaptation to its environment				
Populations and Ecosystems				
A population consists of all individuals of a species that occur together at a given place and time	☆		☆	
All populations living together and the physical factors with which they interact compose an ecosystem			☆	
Populations of organisms can be categorized by the function they serve in an ecosystem. Plants and some micro-organisms are producers, animals are consumers and bacteria and fungi are decomposers. Decomposers are consumers that use waste materials and dead organisms for food	☆		☆	
Food webs identify the relationships among producers, consumers and decomposers in an ecosystem	☆		☆	
For ecosystems, the major source of energy is sunlight			☆	
The number of organisms an ecosystem can support depends on the resources available and abiotic factors such as quantity of light and water, range of temperatures and soil composition			☆	
Diversity and Adaptations of Organisms				
Although different species might look dissimilar, the unity among organisms becomes apparent from an analysis of internal structures, the similarity of their chemical processes and the evidence of common ancestry				
Biological evolution accounts for the diversity of species developed through gradual processes over many generations				
Species acquire many of their unique characteristics through biological adaptation which involves the selection of naturally occurring variations in populations	☆		☆	

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Extinction of a species occurs when the environment changes and the adaptive characteristics of a species are insufficient to allow its survival				
Fossils indicate that many organisms that lived long ago are extinct				
Earth and Space Science				
Structure of the Earth System				
The solid earth is layered with a lithosphere; hot, convecting mantle; and dense, metallic core				
Lithospheric plates on the scales of continents and oceans constantly move at rates of centimeters per year in response to movements in the mantle				☆
Major geological events, such as earthquakes, volcanic eruptions and mountain building, result form these plate motions				☆
Landforms are the result of a combination of constructive and destructive forces			☆	
Some changes in the solid earth can be described as the "rock cycle"			☆	
Soils are often found in layers and consist of weathered rocks and decomposed organic material from dead organisms			☆	
Water circulates through the crust, oceans and atmosphere in what is known as the water cycle			☆	
Water is a solvent. As it passes through the water cycle, it dissolves minerals and gases and carries them to the oceans			☆	
The atmosphere is a mixture of nitrogen, oxygen, and trace gases that include water vapor			☆	
Clouds, formed by the condensation of water vapor, affect weather and climate			☆	
Global patterns of atmospheric movement influence local weather				
Living organisms have played many roles in the earth system			☆	
Earth's History				
The earth processes we see today, including erosion, movement of lithospheric plates and changes in atmospheric composition, are similar to those that occurred in the past			☆	☆
Earth history is also influenced by occasional catastrophes, such as the impact of an asteroid or comet				
Fossils provide important evidence of how life and environmental conditions have changed				
Earth in the Solar System				
The earth is the third planet from the sun in a system that includes the moon, the sun and eight other planets and their moons and smaller objects				
Most objects in the solar system are in regular and predictable motion. These motions explain such phenomena as the day, the year, phases of the moon and eclipses				
Gravity is the force that keeps planets in orbit around the sun and governs the rest of the motion in the solar system				
Gravity alone holds us to the earth's surface and explains the phenomena of the tides				

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The sun is the major source of energy for phenomena on the earth's surface such as growth of plants, winds, ocean currents, and the water cycle	☆		☆	
Seasons result form variations in the amount of the sun's energy hitting the surface due to the tilt of the earth's rotation on its axis and the length of the day				
Science and Technology				
Abilities of Technological Design				
Identify appropriate problems for technological design	☆	☆	☆	☆
Design a solution or product	☆	☆	☆	☆
Implement a proposed design	☆	☆	☆	☆
Evaluate completed technological designs or products	☆	☆	☆	☆
Communicate the process of technological design	☆	☆	☆	☆
Understandings about Science and Technology				
Scientific inquiry and technological design have similarities and differences	☆	☆	☆	☆
Many different people in different cultures have made and continue to make contributions to science and technology			**	**
Science and technology are reciprocal; science helps drive technology and technology is essential to science	☆	☆	☆	☆
Technology provides tools for scientific investigations, inquiry and analysis	*	*	*	*
Perfectly designed solutions do not exist. All technological solutions involve trade-offs, such as safety, cost efficiency and appearance	☆	☆	☆	☆
Reducing risk often results in new technology	☆	☆		☆
Technological designs have constraints; some constraints are unavoidable, other constraints limit choices in the design	☆	☆	☆	☆
Technological solutions have intended benefits and unintended consequences	☆	☆	☆	☆
Science in Personal and Social Perspectives				
Science in Personal and Social Perspectives				
Personal Health	☆	☆	☆	
Populations, Resources and Environments	☆	☆	☆	
Natural Hazards	☆	☆	☆	☆
Risks and Benefits	☆	☆	☆	☆
Science and Technology in Society	☆	☆	☆	☆
History and Nature of Science				
Science as a Human Endeavor				
Women and men of various social and ethnic backgrounds and with diverse interests, talents, qualities and motivation engage in the activities of science and related fields			**	**
Some scientists work in teams and some work alone, but all communicate extensively with others	☆	☆	☆	☆
Science requires different abilities depending on such factors as field of study and types of inquiry	☆	☆	☆	☆

* See SCIS 3+ Technology Correlation
** See SCIS 3+ Literature Correlation

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Science is very much a human endeavor, and the work of science relies on basic human qualities such as reasoning, insight, energy, skill and creativity, as well as on scientific habits of mind, such as intellectual honesty, tolerance of ambiguity, skepticism and openness to new ideas	☆	☆	☆	☆
Nature of Science				
Scientists formulate and test their explanations of nature using observation, experiments and theoretical and mathematical models	☆	☆	☆	☆
Although all scientific ideas are tentative and subject to change and improvement in principle, for most major ideas in science there is much experimental and observational confirmation	☆	☆	☆	☆
Scientists do and have changed their ideas about nature when they encounter new experimental evidence that does not match their existing explanations				☆
In areas where active research is being pursued and in which there is not a great deal of evidence and understanding, it is normal for scientists to differ with one another about the interpretations of the evidence or theory being considered				☆
It is part of scientific inquiry to evaluate the results of scientific investigations, experiments, observations, theoretical models and the explanations proposed by other scientists				☆
Scientists agree that questioning, response to criticism and open communication are integral to the process of science				☆
History of Science				
Many individuals have contributed to the traditions of science			**	**
In historical perspective, science has been practiced by different individuals in different cultures				**
Tracing the history of science can show how difficult it was for scientific innovators to break through the accepted ideas of their time to reach the conclusions that we currently take for granted			**	

** See SCIS 3+ Literature Correlation